

THE ZOOLOGIST

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THE RAVEN AT HOME.

By FRANCIS HEATHERLEY, F.R.C.S.

(PLATE V.)

DURING the autumn of 1908 my friend, H. Earl, explored a likely locality and visited several sites, the points to be determined being accessibility and aspect. He reported on his return that the best site was a nest in a cliff beside a stream. The cliff had a bay in it, and the nest was in an alcove towards the top of the cliff. The hiding-tent could be erected on the other side of the bay just opposite the nest, a little above, and within twenty-five feet of it. The sun reached the nest about midday. He had obtained necessary leave from the landowner's agent, and had made friends with neighbouring shepherd and keeper, who promised to write in the spring.

At the end of March, 1909, we received news that our Ravens had two chicks and two eggs on March 20th.

Owing to the exceptional advantages this site seemed to promise for watching the domestic habits of the birds, I induced E. Selous to join us, and on April 7th we met. As Earl had reported that he could see no means of fixing the camera near the nest, I took with me a heavy platform, which could be slung for the camera from the top of cliff. The weight was intentional in view of prevalence of gales, but the only result was to bring the excess luggage charge up to eighteen shillings.

Whilst having supper at the inn, I asked the girl who waited on us if she knew anything about our Ravens. She told us that

a man was saying in the bar that the nest had been broken up and the birds carried off by some men on the previous Sunday.

April 8th.—Found our way across the fells and caught the shepherd at dinner. He told us that the birds were quite safe, but that the previous Sunday some men had tried to get them by breaking up the nest with a long pole. The young had fallen during the night to the foot of the cliff, where he had found them in the early morning, and he had climbed up and placed them in an old nest lower down than their own, and which, probably owing to its accessibility, had not been occupied during recent years. He took us to the nest, and told us that to the knowledge of his family the cliff had been occupied every year for the last century. He also said that they had no enmity towards the Ravens, as they only attacked dead or dying sheep and lambs, that they were not as harmful as the Carrion-Crow, and that the young were fed on sheep's placenta and carrion, of which latter the Ravens made hidden stores, which his dogs occasionally nosed out. Presently we caught sight of one of the birds soaring up over the edge of the cliff, soon joined by its mate, and then as we got nearer I heard for the first time the hoarse bark with which I was to become so familiar.

The nest from which the young had fallen was not in the alcove, as described by Earl, but in a dark chasm in the angle of the cliff—a much more difficult site; so that the marauders had done us a good turn. The shepherd told us that, although the alcove was a favourite nesting-site, as it could only be got at with a ladder, yet it was very exposed to gales, and he had known the nest to be blown out bodily. The young lay flattened out in the nest, each with a timorous wide-open grey eye cocked up at us.

The present nest was well situated for photographic purposes, but badly for watching, as the only site for the tent was about one hundred feet away and below the level of the nest, so that only the edge was visible.

Selous thought that to ensure the safety of the young the nest had better be watched day and night, and proposed watching the first night; so in the afternoon we hired a man to cart the tent and bedding to the cliff. We put up the tent, and, after covering it with heather, left Selous in it at 6 p.m.

9th.—Earl released Selous at 9 a.m. He reported that ten

minutes after we left him one of the old birds flew into the alcove and watched the young for a few minutes, but did not go to the nest. At nightfall three young men with a little white dog appeared, and, standing by the tent, had discussed how to get at the birds, but when about to put their plans into execution had been much startled by Selous entering into conversation with them. They silently glided away. He said the old roosted away from the nest, and did not come on to it all the morning, although the young were pitifully crying for food. They went down to the shepherds, and, procuring some hard boiled eggs, gave the young one each. Owing to the scared condition of the birds it was decided to keep away from the nest, and watch over their safety from a distance. Selous, watching from the opposite side of the valley, saw the old feed the young by regurgitation. I cannot help thinking that their scared condition is in part due to Selous relying too much on the diurnal habits of the bird, and that coming out of the tent and burning an acetylene lamp inside may have had something to do with it.

In the evening we had an animated discussion about the raid. As usual, the landowner's and shooting tenant's interests are in opposition. Earl was very much against a complaint being made, as it would arouse the gamekeeper's enmity, but Selous and I held that, as the landowner was anxious that the birds should be protected, and as our permission came from him, it was clearly our duty to warn his agent, as we had nothing to do with the shooting tenant. So I wrote, and after that the fat was in the fire. The police easily traced the men owing to their little white dog. They were miners intent on getting ten shillings each for the young birds. The gamekeeper was very angry, but we afterwards placated him by photographing himself, his dogs, and his tame Raven.

10th.—Selous started after breakfast to watch the nest from opposite side of valley. Earl and I followed later, as the sun did not reach nest until midday. Owing to scared condition of the birds we did not think it wise to start operations near nest, but to take a few photographs from the tent. Earl left me at 1.55 p.m. At 2.10 p.m., after a gentle croaking in the air, I saw the shadow of the old bird pass across the sunlit cliff. Immediately the two young birds stood up, shouting and showing their crimson

gapes. Presently the shadow swept across again lower down, and the old bird sailed noiselessly on to the deserted chasm nest. She stood there anxiously peering down at the young, looking as glossy as black satin, and as she peered down the grey third eyelid kept flashing across her eye. I think it must be darker than that of the Hooded Crow, as it does not seem as marked a feature. After a time she sailed down on to a burnt-looking patch of grass almost on a level with the nest, and after some hesitation glided on to the nest, and amid a tumult of flapping wings and half-choked cries she fed both the young by regurgitation, flying off a few seconds later with a piece of white excrement in her beak. The young kept up a continual clamour until she had made five or six visits in fifteen minutes, each time carrying excrement away when she left them.

I have been surprised since my return from this expedition at the number of times I have been asked if the Raven's nest was very foul. As a matter of fact, the Raven, like the Hoodie, keeps the nest scrupulously clean, and the young are quite free from vermin. The myth to which this idea can be traced is mentioned by Isaac Walton, and is quaintly put as follows:—"For a certain annotator saith that the young Ravens while as yet they are unfledged do appear of whiteness, and therefore are neglected of their parents, as if they were bastards, seeing that they resemble not their colour. At which time Divine Providence, who nowhere sleepeth, doth feed them that call upon Himself. For he causeth certain vermicles [small worms] to be bred in the little nest, by eating of which they are sustained, until at length on the ninth day, the feathers beginning to grow, they resemble the colour of their parents, and so come to be nourished by them" (Louis of Grenada). As Reg. B. Lodge points out, the foul nest with "vermicles" was probably that of the Kite. The male also fed the young, but not as frequently as the female. Selous agreed in identifying female by one of the secondary feathers being missing from her left wing. Although the male did not often feed, he frequently watched from the alcove site. The young were fed nine times between 2.10 and 4.30 p.m. At 4.50 one of the old birds, which had been standing preening itself in the chasm site, flew away uneasily, and a few minutes later Earl and Selous relieved me.

Before leaving we wrapped some heather up in a mackintosh, making a bundle about the size of a camera, and fixed it with tripod about twelve feet from nest to act as a dummy camera, covering all with heather.

11th. — Heard Raven's croak through open window in early morning. Walked to nest after breakfast. In crossing moor found Grouse-feathers where there had evidently been a kill (?) Peregrine. Got into hiding-tent at 12.30, raining and blowing hard.

At 12.45 female flew into alcove; this is a recess about six feet wide, with an arched top, and filled with old dead heather-stems. She shook herself, and then crouched in the recess. Presently she hopped and walked to the edge, where she stood whilst the wind ruffled up her neck- and breast-feathers so as to show the bare skin. After looking down anxiously many times, as if in painful uncertainty, she hopped and walked along the ledge towards the nest, the wind from behind often nearly taking her off her feet. After more anxious peering and hesitation she launched out on her sable pinions, and with her primaries stretched out like fingers she slowly floated down on the wind, balancing herself with straightened legs and outstretched toes. With little side tilts and turns she floated down past the nest, right down to the foot of the cliff. Just as she seemed about to alight, she floated right up to the top of the cliff, coming down again slowly along its face with one wing nearly grazing it. Then, just as her outspread toes seemed about to touch the ground, she soared away into the valley out of sight. In a few minutes she appeared again in the alcove, and the performance was repeated. This time she did alight at the foot of the cliff, and her actions were explained when I saw both the young rise up from the grass, crying and showing their crimson gapes. After feeding one bird with some crimson stuff which we afterwards identified with sheep's placenta, she floated up into the air and soared away. Within a couple of minutes she returned, and then the male joined her, both sailing up and down the cliff as if drawn up and down on invisible wires. Often one was coming down as the other was going up; the male looked like a gigantic Chough, his beak all gory with what he carried. Within ten minutes

each of the young had been fed four or five times, until they could hold no more.

When Earl and Selous came shortly after 1 p.m., as it was very evident that the dummy camera had frightened the old birds and so led to the young climbing out of the nest to be fed, we made it less bulky, and, after putting the young back into the nest, built up the edge more securely. There was no lack of building material, as all along the foot of the cliff was a layer of dead heather-stems, in some places six inches deep.

Earl left me about 2 p.m. Fifteen minutes later the female settled in the alcove. She croaked several times, as if calling the male, then soared round and flew away. Presently she was back again in the alcove, and was joined by the male. He had something in his beak, and she crouched facing him, and, opening her beak, passed the lump, which looked like carrion fat. She pouched it, and, flying down to the nest, fed the young.

12th.—Selous watched the nest from dawn. Earl and I went to nest midday. Blowing a gale and raining. Found that the heather had blown off the dummy camera. Substituted camera.

13th.—Gale still blowing. Camera shifted.

14th.—Still blowing. Camera torn off tripod—all exposed to view, and rain; yet young in nest, and did not seem hungry. On way home saw Herring-Gull chase Grouse. Found on developing negatives that camera is not light-tight.

15th.—Found one of the young off nest; put it back, and took camera home for repairs. Looked in at the shepherd's on way home. They have three Geese sitting on eggs in kitchen; each is in a box about two feet square, and twice a day they are lifted out and allowed to go outside. In a few minutes they come back again, and are lifted back into their boxes. Also called at keeper's, and saw tame Raven; it is thirteen years old, and has one claw missing. Keeper says they often when young lose a claw through strangulation by wool in nest.

16th.—Stayed at home and repaired camera. Rain stopped in afternoon. Went for a ride. Never saw so many Curlews; counted eighteen feeding in a small meadow.

17th.—Rained nearly all day. Walked over to nest in after-

noon. Both young in nest; water running through it. Saw a Buzzard on the moor.

18th.—Bright, with occasional clouds; strong wind. Went to gamekeeper's, and wasted an hour trying to take a photograph of "Raaf," the tame Raven. It behaved like a semi-domesticated devil. In one of the cloudy intervals he walked past, surrounded by three black retrievers, snarling at him, whilst he was erect and watchful. Put camera up by nest. Earl left me at 2.20 p.m. At 2.30 female came to alcove site, but soared away again. Settled there again in fifteen minutes, hopped and walked along edge. Sharpened her beak on edge, flew to chasm site, and after peering anxiously at young soared away. She did this nine or ten times, gradually getting nearer the nest. Once when in chasm site she disgorged some lumps of placenta, and after thoughtfully turning them over swallowed them again. At last, at 4 p.m., she sailed on to the nest, and I took her feeding the young. She returned and fed them again at 4.8, 4.10, 4.12, and 4.18, each time flying straight on to burnt patch of grass before sailing on to nest. She does not put her beak so far into theirs now, and it is easy to see the lumps of placenta being passed. After the last feed she never came near the nest again before Earl relieved me at 6.30. Occasionally one of the young stood up at the edge of the nest and flapped its wings, as if trying them. Earl reported that when not at nest female generally took up a position on the opposite fell, near where Selous used to sit to watch the nest, and he several times saw the male transfer food to her there. He seems to do most of the foraging. I have not seen him go to nest since 11th.

19th.—Arrived at nest at 12.50. Whilst putting double back in, the wooden wedge to which camera is fixed came out of cliff, and whole thing had to be dismantled and put up again. Whether it was due to all this disturbance or not, the female only once came to alcove fifteen minutes after Earl left at 3 p.m. Left at five, as sky was clouded over. Rained all night.

20th.—Typical April-day showers and sunshine. Earl left early to keep old birds off nest, as it seems to us that they try to get feeding done when we are not there. I arrived at 12.15. Earl left me in tent at 12.30. At 12.35 Raven pitched in

alcove, walked about, turned round with difficulty owing to high wind. Went on to nest from burnt patch. At 12.43, as sun was shining, took her feeding young. Fed again at 12.47, 12.49, 1.9, and 1.15 p.m. Earl relieved me at 2 p.m. Changed plate, but Raven did not return before we left at 5.30. Saw male transferring food to female on opposite fell about 4 p.m. No bird on negative taken. What had happened was that when she fed them they were quite in the dark recess behind nest, and the tent being below level of nest, I could not see this.

21st.—Earl departed early, and stuffed recess with turf and heather to keep the young to the front. I followed later. Earl left me at 12.20. At 12.30 Raven flew on to chasm nest and peered down; young crying all the time. Then she soared away. Repeated this two or three times, and the last time got as far as the burnt patch. Twice she flew away from this. Once whilst standing there she momentarily regurgitated a piece of placenta, which showed red between her mandibles. Then three or four times she flew from the patch to the nest, and when just about to alight flew away. At last, at 12.45, she flew on to the nest, and I took her, and was sorry, as she had alighted quite close to camera and was out of focus. She walked on to the nest, and after feeding young croaked at the heather and flew away. It certainly does not take much to scare her. The male was close by, although I could not see him; both croaked loudly, as if annoyed. At 12.53 she flew on to nest, and apparently only fed larger of the two young. At 1 p.m. Earl returned, and I changed the plate, and he left me at 1.10 to return at 2 p.m. Female pitched on chasm nest at 1.15 and peered down. The young were apparently asleep as they made no outcry. She then flew away, and did not return till 1.50, when I heard her croak, and found her in the alcove. She looked towards nest and croaked, but young did not reply. She picked up dead heather-stems and dropped them over edge, and seemed annoyed. Then she suddenly cried out and flew away. Earl was within a few yards of tent. She had never let him get so near before. He says both birds made a great outcry this morning when he was blocking the recess, female flying about quite close. Once when he had to shift one of the young, and it cried out, she flew within eight feet of him, as if about to

attack. She then alighted on top of cliff and scolded him. He kept within range of nest to prevent her feeding them. As the sun was obscured and not likely to clear we went home.

22nd.—Spent most of morning trying to photograph "Raaf" and the dogs. Keeper says that our birds are old male and last year's female. The original female was trapped last year. He also mentioned that when the old birds drive the young away in January, they pursue them for miles, and the outcry is considerable. Made friends with "Raff" by means of raisins and sweets. Seemed to pouch everything, and then hide it. Joined Earl at nest at 12. Earl left me at 12.20. Old bird in alcove at 12.30. Got as far as chasm and burnt patch, but not on to nest. Earl came at 1 p.m., the idea being to interrupt feeding if it took place, and enable me to change plates, as if once fed there is not much chance during rest of day. He noticed that the larger youngster had climbed on to top of heather, and against my advice tried to get it down into nest. He climbed up to dislodge it, when the smaller bird sailed off the nest down the hill, turning summersault and squawking at end. Earl went after it, and there was a great hubbub. Both old birds flew to its rescue, the mother flying round Earl a few yards from his head, but the male well in the background. By the time he got the youngster into nest the other had climbed down. Earl left me at 2 p.m.; immediately afterwards the female appeared on top of cliff, croaking loudly, but, although she spent some time at chasm, I was not surprised that she did not visit nest. Gave up at 4.30, as light was bad.

23rd.—Rained in morning, cleared up midday. Earl left me in tent at 2 p.m. At 2.10 young began to cry. Female made three or four false starts from alcove to chasm and burnt patch, but finally went on to nest about 2.13, and then flew off without feeding. Then between 2.15 and 2.30 fed young seven times. Took her in what ought to be good position. On Earl's return at 2.30 found shutter had not gone off; leak in tube. As probably they would not be fed for some time, took some photographs of young. Then, as light was good and young seemed to be getting hungry, Earl left me at 4.45 p.m. Old bird back on chasm nest in a few minutes, and then fed young five times in twenty minutes, after which she cleared off alto-

gether. Took her feeding young. During day, when not engaged in preening, young have been exercising their wings. Each in turn backs on to edge of nest, and flaps its wings vigorously for some minutes. Only some of secondaries and tail-feathers show any quill. Third eyelid filmy, and not as white as old bird's. Saw one deliberately evacuate into nest to-day; as a rule they back to its edge. Female has not lately carried excreta away. She seems to feed the bigger one first, and keeps on bringing food as long as they cry. Saw female turn summersaults in air to-day and yesterday. Whilst flying round she closed left wing, and made complete turn sideways. Every afternoon lately a pair of Kestrels have come up the valley at the same hour. As they come past the nest the Ravens attack them, but, although they make terrific stoops, the Kestrels easily steer clear of each attack.

24th.—Rained all day.

25th.—Cleared up midday. Earl had gone early, and put up a large piece of white tape over nest to scare old birds off till we were ready. Earl left me in tent at 2.15. Old bird back in a few minutes. Very timid about going on to nest, although young crying loudly. When at last she fed them at 2.30 the sun had just become obscured. Earl came at 3 p.m. to see progress, but although I waited till 5.30 there was no more feeding. Although it hailed and rained at intervals during afternoon, the young did not seem to notice it, but went on with their preening and wing exercises. They do not sleep as much now. Saw some more nuptial antics to-day. Both old birds were on the opposite fell most of the afternoon. Once the male, after feeding the female, did a sort of ungainly dance before her; flapped his wings whilst facing her, and jumped up into the air three or four times; jumped up two or three feet. On another occasion they walked after one another, retreating and advancing until I did not know which was which. Then they stood facing one another with their beaks touching. They stood motionless like this for over five minutes. Selous, before he left us, said we might see nuptial antics towards the end of sojourn, as in those that have two broods the antics begin again towards end of first brooding; so antics may show at same time in these birds, although they have no second brood.

26th.—Cloudy. Sun came out at 11.30. Earl left me at 12.30. Beyond coming occasionally to assure herself that young were all right, the female did nothing all the afternoon. As it was clouding over I gave up at 4 p.m., but as there seemed prospect of more sun, I returned and got into tent. Shepherd on his afternoon round joined us, and had a look at young. Found one off nest. Earl put it back, and against my advice tried to get the other to come down off the heather at back. He and shepherd left me at 4.30. Both old continued to fly round, making great clamour, and female paid several hurried visits to chasm nest, peering down and flying off again. Earl returned at 5.30 to say that in trying to shift bird it flew out unperceived by me, was caught by wind, and blown up on to top of cliff. He says shepherd thinks that if we want any more photos we had better clip the young. He left it at top of cliff and walked with shepherd, to let things quieten down a little. On his return he tried to catch the young bird, but it soared out and flew down the valley, with one old bird on either side of it. So he came down and told me. We then sat down at a little distance, and watched the old birds. They visited a spot on a precipitous scree about a quarter of a mile down the valley, and at last, through the glasses, we thought we saw the young bird. So we went down to the spot and searched high and low, but could not find it. We then returned and took three inches off one wing of bird in nest, and then resumed our watch. Finally we came to the conclusion, from frequent visits of old birds, that youngster must be in a patch of heather on side of fell. Had nearly given up search when looking up I saw it in a small birch tree. Earl tried to get it, whilst I went to a point giving good outlook. Earl failed to get it, and it soared right across valley, and began to hop and walk up the fell. I stayed same side whilst Earl went after it. After a long time Earl headed it off, when it flew again to my side. Guided by signs from Earl, I got to it, and managed to throw my coat over it. Clipped one of its wings and put it back into nest. On way home saw male hunting round for youngster near where we caught it. Looked in at shepherd's. He was very surprised to hear we had caught young. Said some years ago the Duke gave a farmer permission to take a young bird. He turned up early one morning on

horseback, and just as he had made up his mind which of the four he would take they all soared out into the valley. Although no further advanced than ours, it was only at 7 p.m. that he looked in at shepherd's on his way home to say that it was only when he and the horse were nearly dead-beat that he managed to secure it about ten miles from the nest; so our three hours' job was easy in comparison. At Earl's suggestion the shepherd is to put a scare up by nest each morning on his way past at 5 a.m. to prevent young being fed before our arrival.

27th.—Earl left me in tent at 1 p.m., after we had taken down shepherd's scare, which consists of a kite's tail. Female, very shy of coming on to nest, stood on burnt patch with beak full of food, slobbered a lot of saliva. Young did not shout much. Twice saw them yawn during afternoon. Not fed.

28th.—Windy and cold; sun only at intervals. Snowstorm in afternoon. Earl took refuge with me in tent. Only fed once. Left at 4 p.m. Light bad. Fells all covered with snow.

29th.—Took down scare at 1 p.m. Old bird back in fifteen minutes. Fed young twice in three minutes. Sun obscured. As Earl was not due till 2 p.m., I thought I had better come out in case they got filled up. Couldn't find Earl, so went back into tent. She evidently does not mind me, as she was back in ten minutes. Unfortunately she hesitated long enough on the burnt patch for sun to go in. She came again, but after a long interval, and no sun. Thundered; went home in a snowstorm, with the largest flakes I have ever seen, all about the size of half a crown; going down a rough road with first one and then the other eye blocked was quite exciting.

30th.—Very cold, cloudy, but with fairly long intervals of sunshine. We have for some time thought that the female must keep a store of food near the nest, as the intervals would not allow of her going to male for it. This must be so, as Earl says that during last few days he could always tell when young were being fed, as on such occasions the male accompanies him wherever he goes, scolding him all the time. Female fed young at 2 p.m., and again in a few minutes; so I came out and changed plates, and, as she returned again in a few minutes, I took her again just as she stood still looking at them after she had fed them. This turned out to be the only decent negative

of the lot. After the second photograph Earl came round, and after I had changed plates he stayed in vicinity, because a snowstorm was coming up. Very cold inside tent, and by Earl's appearance not much better outside. When sun showed signs of coming out Earl went off. Although the sun shone for two hours, and the young shouted for food, neither of the old birds returned. Just before Earl left one of the youngsters flew out, and there was a great commotion whilst he caught it. When he came back he said that both the Ravens had pursued him across the moor for over a mile, both swearing at him, and the female at one time walking on the ground behind him not more than twenty feet away, cursing him volubly. The difference in size of the young is, I think, a sexual difference. The smaller has the higher pitched voice. Although voices of old vary according to excitement, being low-pitched when quiet, yet I think the male has the higher pitched voice of the two.

May 1st.—Before starting proceedings intended to photograph the young. Their beaks, which at first were flesh-coloured, are now nearly quite black; the pigmentation spreads towards middle from both tip and base; the base has strong bristles pointing towards tip. They are as large as the old birds, and only a few tail-feathers show quills. At no time have they quarrelled in the nest. Just when about to make the first exposure first one and then the other sailed off the nest, and flew up the valley, with the old ones accompanying them; so bringing our task to an end. The shepherd says that it is only for the first day or two that the old bird mothers them. He also states that he has known them to have six young, and that this would give us best opportunities, as they take quite a fortnight longer to reach maturity.

Before leaving us Selous pointed out that it would be interesting to get some explanation of the fact that in nearly all references to the Raven, either in the Bible or in fairy stories, it figures as an unnatural bird which does not feed its young. I think that, considering the difficulties we experienced, it may be concluded that the ancients, being without field-glasses or hiding-tents, found it hopeless to watch the old birds feed the young, as being both timid and wary they would not approach nest whilst conscious of being watched. The annual driving

away of the young could not fail to arrest attention, and would only confirm the impression of the old being unnatural parents. I think the annual driving away may explain how if one bird is killed it soon finds a mate. All those birds that have been reared there will probably look upon it as a desirable site, and will join if wanted. As to where the new bird comes from, there is no knowing how many unpaired birds there may be in the neighbourhood, for if a solitary Raven is seen some miles from the nest, the natural conclusion is that it is one of the breeding pair, but it might not be so.

As regards nuptial antics, I forgot to mention that a few days after the male's dance before the female I saw her do the same thing when alone.

Some weeks after leaving I heard from the keeper that our two young flew over nearly every day and joined "Raff" on the fell, making a great noise, which he did not seem to like.

I should very much like to mention the locality of this nest, as the alcove site could not be beaten as regards opportunities of watching, and the young could by means of a ladder be easily placed there. But so long as ornithology is infested by a number of born stamp-collectors who have missed their vocation, and who do ornithology more harm than any other of the bird's enemies, it is not wise to do so.

I may say for the benefit of those who wish to help in preventing the extinction of our rarer birds, that by scribbling all over an egg with a blue marking-ink pencil marks are made which cannot be washed off without obliterating the natural blotches of the egg. I recommend this as a slight measure of protection against those who have not outgrown the childish state in which the desired object to give any pleasure must be grasped, even if the grasping entails destruction.

I have often wondered why the Raven should breed so early, and cannot help thinking that the hatching of the young in the lambing-time is more than a coincidence.

After all I have seen and written, I yet think that the best description of the Raven's habits in a few words is, after all: "He giveth to the beast his food, and to the young Ravens which cry. For that their mother's heart is hardened, fearing a snare, she hasteth not; she will not be taken."

MISCELLANEOUS NOTES ON ZOOLOGICAL INSTITUTIONS RECENTLY VISITED IN EUROPE.

BY CAPT. STANLEY S. FLOWER, F.L.S.

(Continued from p. 295.)

7. LYONS, FRANCE.

(i) *Zoological Gardens.*

THE Zoological Gardens of Lyons form part of the beautiful Parc de la Tête d'Or, on the left bank of the Rhone, at the north end of the city. This park covers an area of just over 281 acres (114 hectares), and was laid out in 1857 by the landscape-gardener, M. Buhler. It may be divided into two parts: first, the lake of 42 acres (17 hectares), woods, lawns, and drives; and, secondly, the scientific side, containing the botanical garden, the palm-house (which is said to be 23 metres or 75½ ft. in height), the hothouses (including the *Victoria regia* house), the alpine garden, and the menagerie, which is grouped round the Observatory building near the centre of the park.

The whole institution belongs to the Municipality, and is open free to the public. M. P. Didier is the Director of the Zoological Gardens.

In comparison with most other gardens, the chief features of the Lyons menagerie that impressed me in the three visits I made to it in October and November, 1908, were, first, the large size of the paddocks for Ungulates; secondly, the large amount of running water; and, thirdly, that there was a label for *every* species of animal exhibited, giving the scientific and French names of the animal, and, where required, the name of the donor of the exhibit.

The menagerie contained about one hundred and fifty-five mammals, representing thirty-seven species (but this includes no fewer than sixty-eight individual Fallow Deer, *Cervus dama*), representatives of fifty-seven species of birds, two large Missis-

sippi Alligators, and a few small land Tortoises. The most interesting exhibits were a very fine and remarkable Syrian Bear, presented by Mr. Lortet, a Rhone Beaver, and three very handsome black Humped Cattle from Madagascar, presented by Mr. Grammont.

Of inanimate exhibits in this park attention may be called to the Erratic Blocks brought by prehistoric glaciers from the Alps or Jura Mountains to the neighbourhood of Lyons, and to the also prehistoric dug-out canoe, about 32 ft. (say, 10 metres) in length, found by M. Gobin in 1862 on the banks of the Rhone.

(ii) *Bidel's Menagerie.*

In October, 1908, I saw Bidel's Menagerie (which is said to have been founded in 1830) in the Cours du Midi, at Lyons. The collection consisted of nineteen Lions, two Tigers, four Leopards, three Pumas, two Wolves, one Polar Bear, one Black Bear, and a few Monkeys. The animals appeared very healthy and well cared for, and I found their trainer was the old Sudan traveller, Mr. Salvator.

8. MARSEILLES, FRANCE.

Zoological Gardens.

During 1908, 1909, and 1910 I visited these charming gardens on six or seven different occasions. Representatives of about fifty-eight species of mammals and ninety-four species of birds were usually to be seen. Of particular interest were a young Sooty Mangabey (*Cercocebus fuliginosus*), born here in 1908; a very handsome male Leopard from Yunnan (*Felis pardus fontanieri*); a pair of Water Buffaloes (*Bos bubalis*, var. dom.), with magnificent horns, which were led about the gardens by a keeper; three very remarkable Long-eared Goats from Mount Carmel, presented by Mr. Grandval; and specimens of the Seychellian Pigeon (*Alectraenas pulcherrima*).

9. MUNICH, BAVARIA.

Zoological Gardens.

The new Zoological Garden "Verein" of Munich, has its offices in the Kaufinger Strasse, 23 II., and 54 acres (22 hectares) of land on a sixty-year, rent free, lease from the city, on the

right bank of the Isar, just south of the Talkirchen Bridge over that river.

In May, 1910, Herr Ober. Lieut. Herman Manz, the President of the Society, kindly took me over this site, showing me the plans of the proposed buildings, enclosures, &c., which had been drawn up with the assistance of Prof. L. Heck and Dr. G. Brandes, and had been approved by the municipal authorities. The site appears to be an admirable one for the purpose. To the west is the Isar, "rolling rapidly," and double banks (with low ground between them to take water if necessary) have been made to prevent flooding the gardens when the river is swollen by the melted snow from the mountains. To the east is high ground dropping steeply into the gardens. This hill shelters the whole site from east winds, and a thick belt of trees along the river side shelters the site from west and south winds, and proposed buildings at the north end of the site will eventually also shelter the gardens from north winds. The centre of the grounds is meadow land, with a canal flowing through it from south to north.

Besides the fifty-four acres already appropriated for the Zoological Gardens, another piece of ground to the north is available for future extension, and it is proposed to use it for the establishment of an exhibition of domestic cattle.

The features of the site of the new Munich Zoological Gardens are :—

1st. Its picturesque position by the river, with fine views up the valley, ending in glimpses of distant snow-crowned mountains.

2nd. Its existing trees : well-grown old trees of many kinds. In planning the proposed buildings and enclosures great care has been taken to avoid in any way damaging these trees.

3rd. Its dells and woodland ponds, which will be utilized as enclosures for waterfowl, &c.

4th. The steep hillside on the east, with natural outcrops of rock, which is to be transformed into an alpine flower garden, with enclosures for Chamois, &c.

5th. The sheltered position of the central meadow land, where good paddocks can be made for Antelopes, &c.

6th. The abundant water supply. It is proposed to have large ponds for various aquatic mammals, as well as for birds.

7th. The fact that, owing to the configuration of the ground, and also to adjacent property belonging to the Municipality, the gardens cannot get "built in," or their appearance spoilt by houses being built overlooking them, as at Antwerp, Berlin, &c.

The site is inhabited by many wild birds, and the Society is putting up nesting-boxes, and doing what it can to protect and encourage the birds.

The proposed scope of these new Zoological Gardens is very ambitious; it includes houses for all wild animals usually kept in captivity, and also an aquarium.

10. NAPLES, ITALY.

The Aquarium.

I do not intend here to give any description of the world-famous Zoological Station of Naples (its imposing buildings beautifully situated in the park by the sea "Villa Nazionale," its library, rows of large and sumptuously fitted workrooms, its cosmopolitan workers and the large sums of money spent on it are all well known), but to confine my remarks to that part of it, the Aquarium, which is open to the public.

The chief interest of this Aquarium is that the animals and plants exhibited in it are local, being all from the Gulf of Naples. From the point of view of the casual visitor it differs from other aquariums in that he has to pay more to see it, the entrance price being two francs per person. The exhibits are not labelled, but extremely well written and profusely illustrated guide-books, in several languages, can be purchased.

In July, 1910, the collection of live animals I saw in the Naples Aquarium consisted of:—

REPTILES.—One Loggerhead Turtle (*Thalassochelys caretta*).

FISHES.—Representatives of forty to forty-six species: One or two *Anguillidæ*, one *Murænidæ*, one *Centriscidæ* (several individuals of the quaint red Trumpet Fish, *Centriscus scolopax*), two *Syngnathidæ*, one *Mugilidæ*, one *Gadidæ*, five *Serranidæ* (including many individuals of the Marine Gold Fish, *Apogon rexmullorum*, which are bright red with conspicuous black eyes), one or two *Sciænidæ*, nine or ten *Sparidæ*, one *Mullidæ*, one *Caproidæ* (several individuals of the red Boar Fish, *Capros aper*), three to five *Labridæ*, two *Pleuronectidæ*, one *Gobiidæ*, one

Scorpenidæ (very many individuals of *Scorpena porcus*), two *Triglidæ*, one *Trachinidæ*, one *Uranoscopidæ*, one *Blennidæ*, one *Balistidæ*, one *Scyllidæ*, one (?) *Carchariidæ*, one *Raiidæ*, and one *Trygonidæ*.

Special attention may be called to the families *Sparidæ* and *Balistidæ*: among the *Sparidæ* to some large specimens of the Gilt-head (*Pagrus auratus*) and of the Pandora (*Pagellus erythrinus*) in Tank No. 5, and to the fact that a Sea Bream (*Cantharus vulgaris*) has lived five years in captivity here (see 'Guide pour l' Aquarium,' Naples, 1908, page 101).

I saw five individuals of the File Fish (*Balistes caprisus*) in Tank No. 8; these formed a most interesting exhibit, and, speaking personally, I considered that even if there had been nothing else to see in Naples it was well worth while to have gone there only to have seen these curious and attractive fish alive and in, apparently, good health, but I was sorry to learn that they do not live long in captivity. The 'Official Guide' (edition of 1908, page 101), says of the File Fish:—"C'est un poisson vif, curieux et bon camarade; il ne jouit de toutes ses facultés qu'en été, parce qu'il est très sensible au froid et meurt généralement au commencement de l'hiver. Sa nourriture consiste en mollusques et en crustacés; il les broie de ses dents puissantes; on peut entendre le bruit de ce travail à travers les vitres du réservoir."

I am very glad to hear now (March, 1911) from a worker of the Naples Zoological Station who is visiting our Nile Aquarium at Gezira, that they are proposing to heat the tanks in the Naples Aquarium; so that such interesting forms of life as *Balistes* may have longer careers in captivity there.

CEPHALOCHORDATES.—Specimens of the Lancelet or Amphioxus (*Branchiostoma lanceolatum*).

TUNICATES.—Five species of Ascidians, including *Phallusia mammillata*, the red *Cynthia papillosa*, and very many individuals of the white, translucent *Ciona intestinalis*.

INVERTEBRATES.—The Naples Aquarium is particularly rich in invertebrate animals, and of the very many interesting live things to be seen there I will only mention those I particularly noted at the time of my last visit.

Among the Arthropods there were two fair-sized individuals

of the King-Crab (*Limulus*) (surely not from the Gulf of Naples!), several Thornback Spider-Crabs (*Maia squinado*), the curious Box Crab (*Calappa granulata*), and an olive-brown Cicada-Prawn (*Scyllarus latus*).

The Echinodermata were represented by at least seven species of Star-fishes (*Asteroidea* and *Ophiuroidea*), four of Sea-Urchins (*Echinoidea*), and two of Sea-Cucumbers (*Holothuroidea*).

The Cephalopoda exhibited comprised six specimens of the Octopus (*Octopus vulgaris*), eleven of the Squid (*Loligo vulgaris*), and two of the Cuttlefish (*Sepia officinalis*).

Of the Gastropoda attention may be called to the specimens of *Doris*, to the large black Sea-Hare (*Aplysia limacina*), and to the War-trumpet Shell (*Triton nodiferus*).

The Ctenophora were represented by two species of *Beroë*, and the Anthozoa by a large series of Sea Anemones and Corals.

11. PARIS, FRANCE.

(i) *Jardin des Plantes*.

To properly appreciate this wonderful place, the cradle of zoological science, the Mecca of zoologists, the visitor, if he has not been brought up to a knowledge of it from childhood, should first read some of the literature bearing on its history.*

This history is so full of the names of famous men that at every epoch it is of absorbing interest, but by dividing it into four periods, as suggested below, it will be easier for the visitor to trace out the varied fortunes of the institution and the evolution of the grounds and buildings.

I. The Brosse period, 1626–1643.—The physician, Guy de la Brosse, appears to be the founder of the Jardin des Plantes, and was its first Intendant. In 1626 Louis XIII. approved the acquisition, in the Faubourg St. Victor, of a house and twenty-four acres of land for the purpose of what may be called a

* (i) 'History and Description of the Royal Museum of Natural History,' translated from the French of M. Deleuze, Paris, 1823. (ii) 'Guide des Etrangers dans le Muséum d'histoire naturelle,' Paris, 1855. (iii) 'Guide à la Ménagerie des Reptiles,' Léon Vaillant, Paris, 1897. (iv) 'The Royal Menagerie of France,' E. T. Hamy, Smithsonian Publication No. 1155, Washington, 1898.

Medical-Botanical Garden and Museum. The work commenced in 1635, and in 1640 a garden, ten acres in extent, was opened. De la Brosse laid out the grounds, under the superintendentship of the King's First Physician Bouvard, and assisted by the botanist Vespasian Robin. Vespasian's father, John Robin, the Royal Botanist, helped to provide the new garden with plants. De la Brosse died, in the garden he was creating, in 1643, and was there buried.

II. The Fagon period, 1671-1718.—Fagon, great-nephew of Guy de la Brosse, was born and brought up in the Jardin des Plantes. In 1671, on the death of Denys Jonquet (who had succeeded Vespasian Robin), Fagon was given the chair of Botany, and later he became both Superintendent and Intendant of the Institution. In 1715 he resigned his official duties, but continued to live in the garden, and there died in 1718.

It was under Fagon that the famous botanists, Joseph de Tournefort and Antoine de Jussieu (uncle of Antoine Laurent de Jussieu, 1748-1836) were appointed to the staff of the Jardin des Plantes.

III. The Buffon period, 1739-1788.—Buffon was only thirty-two years old when he was appointed Intendant in 1739. While he held office he accomplished a marvellous amount of progressive administrative work, not only in the matter of gardens, museums, and publications, but also in opening the collections to the public. He wished to form a zoological garden in the grounds, but died in 1788 without seeing the realization of this plan.

Among the men that Buffon appointed to help him in these works were :—

(i) Louis J. M. Daubenton, who, at the age of twenty-nine, became Buffon's zoological assistant in 1745, and remained in the Jardin des Plantes till he died there on the last day of 1799, and was buried on the hill of the Labyrinth.

(ii) The younger Daubenton, who assisted the elder, his cousin, and retired on account of ill-health four years before the death of Buffon.

(iii) J. A. Thouin, Head-gardener from 1745 till his death in 1768.

(iv) Andrew Thouin, son of J. A. Thouin, born in the

gardens, 1747, succeeded his father and was later made Professor of Agriculture.

(v) John Thouin, son of J. A. Thouin, born in the gardens, 1756; became Chief Gardener.

(vi) James Thouin, born 1751, became Secretary and Cashier.

(vii) John Francis Lucas, born in the gardens, 1747, became Keeper of the Galleries of Natural History.

IV. The New Organization Period, 1793 and onwards.

Among the buildings in the Jardin des Plantes the visitor should particularly note :—

(i) The Rotunda, designed by M. Molinos in 1802; commenced 1804, finished 1812.

(ii) The Lion House; commenced 1818, finished 1821.

(iii) The Reptile House, opened in 1874.

(iv) The Grand Volière, or Great "Flying Cage," certainly the best and most handsome construction of its kind that I have hitherto seen in Europe. I was told that it cost 10,000 francs (£400) to build.

Among the more interesting mammals that I saw alive in the Jardin des Plantes in October, 1908, may be mentioned :—

Four Chimpanzees.

The great Mandril, presented by Monsieur Lesieur in 1897.

A male Gelada Baboon (*Theropithecus gelada*), recently deposited by M. Maurice Rothschild. This Baboon has the extraordinary habit of reverting the upper lip, so as to hide its nose.

An Aye-aye (*Chiromys madagascariensis*), recently acquired.

A hybrid Zebra, bred from a male *Equus burchelli chapmani* and a female *Equus zebra*.

The nice little herd of five specimens of the rare North African Hartebeest (*Bubalis buselaphus*).

A young male Addax Antelope (*Addax nasomaculatus*), from Goudnam (? Goridam) in the French Sudan, presented in 1908 by Monsieur Girard, Sergeant Télégraphiste.

A male Gazelle (*Gazella dorcas isabella*) (?) which came from the French Sudan with the Addax.

A female *Gazella mohr*, a very large animal, in fine condition, presented by M. Girard in 1906.

A young male Giraffe from Timbuctoo.

The Alligators (*Alligator mississippiensis*) of the Jardin des Plantes are famous. Prof. Léon Vaillant, writing in July, 1897 ('Guide à la Ménagerie des Reptiles,' pages 2 and 3), mentions—"plusieurs individus existent au Muséum depuis 1852, ils pouvaient à cette époque mesurer 70 cent. à 80 cent. et peser de 3 kilg. à 4 kilg., aujourd'hui leur taille dépasse 3 mètres et leur poids est de plus de 82 kilg.; à l'état de liberté la croissance doit se faire sans doute plus rapidement."

It may be of interest to note here that a male *Alligator mississippiensis* in the Giza Zoological Gardens, on September 20th, 1899, was in total length 2 ft. 6½ in. (.77 metres), died on March 28th, 1911, and was then found to measure in total length 8 ft. 9 in. (2.66 metres) and to weigh 309 lb. (140 kilos.).

Early in 1910 the Menagerie went through a most trying time; the Paris correspondent of the London 'Daily Telegraph,' January 29th, 1910, wrote of the Jardin des Plantes:—"Now in the direst plight, the heating apparatus being submerged, and there are no means of warming the houses of the Monkeys and Reptiles, which are encompassed by water. A platform has been erected for the Giraffe, but the Elephants and Hippopotami are still wallowing in icy slush. The Gardens are meanwhile closed to the public."

(ii) *Jardin d'Acclimatation.*

I visited the Jardin Zoologique d'Acclimatation in the Bois de Boulogne on October 27th, 28th, and 29th, 1908. As on former visits in 1896, 1899, and 1907, I found that the chief feature of the menagerie was the large series of domesticated or semi-domesticated animals.

But the collection is not limited to these; among the mammals that I saw in 1908 may be mentioned:—Sixty-two Monkeys, representing eleven species, including three small Mandrills, and two very fine grey-cloaked Sacred Baboons (*Papio hamadryas*); ten Lemurs of seven species and subspecies, two or three Sea-Lions, two Seals, two Kinkajous (*Potos flavus*), Porcupines of three genera, two Indian Elephants, two American Tapirs, two Chapman's Zebras, one Grant's Zebra, at least twenty-nine Antelopes representing six species, two very fine male Spanish Wild Goats, "*Capra agrimia*," one Reindeer, a

male Sudan Giraffe, a Collared Peccary, and an Afriver River-Pig.

The most remarkable birds on exhibition were two Sun-Bitterns (*Eurypyga helias*), which displayed beautifully one afternoon. The display of the Sun-Bittern is, I think, one of the most marvellous sights that any human being can be privileged to see. Their keeper told me that these two Sun-Bitterns have lived here for eleven years.

A group of twenty-three Penguins (*Spheniscus demersus*), and an Ostrich, harnessed into a cart, should also be mentioned.

The Aquarium contained only Axolotls and six species of freshwater fish.

The tameness of the wild Hooded Crows (*Corvus cornix*) in this garden appeared to me noteworthy. In England I have found this species most shy and evasive, but in Paris it appeared to be familiar and aggressive, almost but not quite so much so as the resident Hooded Crows of Egypt.

12. SOUTHAMPTON, ENGLAND.

Museum.

I visited the Hartley University College Museum at Southampton on October 4th and 6th, 1909. The Institute to which it is attached was founded by bequest of Henry Robinson Hartley, who died in 1850. The building was opened in 1862. The Museum is open free to visitors daily (except on Tuesdays, when I understand that sixpence is charged per person).

This Museum consists of a large hall with two galleries running round it, all lighted by skylights in the roof. The lower gallery is ornamented with fifteen shields painted with the arms of Hampshire towns. The upper gallery is ornamented with pairs of horns, one of African Buffalo, one of Indian Buffalo, one of Gayal, three of long-horned Domestic Oxen, and one of Kudu. The skin of a large Python from Zululand is also hung from the lower gallery, and two trunks of New Zealand tree-ferns extend from the lower to the upper gallery.

The collection on the ground floor consists of zoological, palæontological, and geological specimens, and also of local antiquities; noticeable are remains of *Bos "primigenius"* found in 1887 when excavating new docks at Southampton, a very

large skull of a recent marine Turtle, a model of an Eel (*Anguis vulgaris*) (modelled by Frank T. Buckland, born 1826, died 1880), which was caught in the Test, Hampshire, and weighed 7 lb. (3.17 kilos.), and the head of a $23\frac{1}{2}$ lb. (10.66 kilos.) Pike (*Esox lucius*) caught in the Itchen, Hampshire, in 1877.

The two galleries are mainly occupied by books, with small mineralogical specimens in the cases on the railing of the lower gallery.

The most noteworthy (to my particular fancy) specimen in this Museum is the skull of a large Crocodile, labelled:—
“Skull. Old World Crocodile, probably Indian.” It measures—

Length, without lower jaw, about 2 ft. $4\frac{1}{2}$ in. = 723 mm.

„ with „ „ „ 2 „ $9\frac{1}{4}$ „ = 844 mm.

It is a remarkably rugged skull. There are no bony ridges in front of the eyes (as in *Crocodylus porosus*), but there is a large flattened median boss of bone about a quarter to a third of the distance from the eyes to the nostrils.

(To be continued.)

NOTES AND QUERIES.

AVES.

White-tailed Eagle no longer breeding in Ireland.—It is with great regret that I have to state that the last pair of White-tailed Eagles breeding in Ireland have disappeared from their old breeding haunts on the North Mayo cliffs. The last stronghold and refuge of the *Haliaeetus albicilla* in Ireland, where they have regularly bred from time immemorial, after a long struggle for existence, have now fallen by the traps and poison of the keepers of adjacent grouse-shootings, by whom they had long been doomed to destruction, and the marvel is that they had so long escaped the keeper's vengeance. It is sad to think that for the future neither naturalist nor tourist will enjoy the sight of these noble birds in their haunts on the magnificent cliffs of the Mayo coast, rising from the water to a height of seven to eight hundred feet. Now that the birds have disappeared there is nothing left to remember them by except the old nests, still visible in several places along the cliffs, and resembling cartloads of dead and rotten sticks—the withered stems of heather. There is one on the great cliff of Loughmuriga, two or three miles from Belderig, another on Alt More, and three to be seen on the great cliff of Alt Redmond, and the one last used on Spinks; these five last-named are situated on the range between Porturlin and Portacloy. I remember when two pairs bred on these great cliffs, and in winter one or two of the immature birds used to take up their abode on the sandhills of Bartragh Island, Killala Bay, where they subsisted on the rabbits and any dead fish thrown upon the shore. These annual visits took place regularly every season until 1856, when they ceased, and since then only a very occasional visit has been noticed, evidently showing that the war of extermination had then begun. When I first visited the North Mayo coast, July 1st, 1892, specially to ascertain whether Eagles still bred there, I was fortunate in my quest, for on inquiry I was told that a pair still bred there, and had a nest with young on Spinks Cliff, situated between Porturlin and Portacloy; so, driving round to Porturlin, I engaged a boy to show me where the nest was, but after leaving the village and

reaching the top of the cliffs, my guide, seeing his comrades going out mackerel-fishing, left me and joined them, but first giving me some very vague directions as to the position of Spinks. However, I walked on for an hour, seeing no sign of Eagles, when I thought of returning, as it was getting late, and I had before me a drive of fifteen miles to my lodgings in Belderig. I had not walked more than a couple of hundred yards on my return when I heard the angry cries of a Peregrine, and, the sound coming nearer, I looked round over the great bog, and then perceived the cause of the Peregrine's anger—a splendid Eagle, slowly flying in from the bog, with the angry Peregrine close after him in full cry; the Eagle, taking no notice, kept straight on, passing right over me within easy gunshot, and carrying a large hare dangling from his talons, held by the head and forequarters. He passed slowly on, disappearing over the cliffs to where it was evident the nest and young were situated. As I had no idea as to the exact position of the nest, I continued on my return, not reaching Belderig until after nine o'clock, very tired, but highly pleased at the very unusual sight, to me, of an Eagle carrying a hare to its young.

The following year I again visited the cliffs with a young friend, but, although we saw no sign of Eagles, were told they were about the cliffs as usual, but could get no account of a nest to be seen. Two years after I again went to the cliffs, and heard the same story, but no one had seen a nest. After that I did not visit North Mayo until May, 1898, when, in company of my old friend, Mr. R. J. Ussher, of Cappagh House, Co. Waterford, and my old and lamented friend, the late Howard Saunders, of London, we heard from the men that Eagles were about the cliffs that season, but no one saw a nest. However, as we walked along the cliffs, we had evidence of the truth of their statement, for when passing Spinks we picked up an Eagle's feather, and the clean-picked skeleton of a hare that must have been killed within a week or two at farthest. This was the last authentic evidence I have had of the Eagles in their old haunts; any stories since then of Eagles living about the cliffs are unreliable, as I found out when visiting that coast along with my friend, R. M. Barrington, the 2nd of the present month (August). We went by steamer from Sligo to Portacloy, and had a most enjoyable run along the Sligo coast, across Killala Bay, and the Mayo coast to our destination, Portacloy. On the morning of our arrival we walked over the hill to Spinks cliff, but saw no appearance of Eagles at the old haunt. Next morning we engaged a four-oared curragh, and rowed along the

base of the cliffs as far as Porturlin, in order to have a closer view from the sea of the face of the cliffs, especially those haunted by the Eagles, but saw no trace of them; then, when questioning the boatmen, who were constantly in their currachs fishing all along that part of the coast, they all agreed that it was some years since any Eagles were observed in their old haunts, good evidence of their final disappearance. Thus has ended the race of Irish White-tailed Eagles. I may further add that there are only two breeding haunts in Ireland of the Golden Eagle, but how much longer the birds will escape their destroyers is hard to say, though one nesting-site is carefully preserved by the owner of the estate. — ROBERT WARREN (Ardnaree, Monkstown, Co. Cork).

P.S.—I mentioned in the foregoing notes that there were only two breeding haunts of Eagles now in Ireland. I regret that I was mistaken, for I now hear from my friend, R. J. Ussher, that on his last visit a few weeks ago to Muilrea he found that the Eagles were extinct, where in 1898, in company with the late Howard Saunders, of London, they had the pleasure of seeing a pair of Golden Eagles soaring round that great mountain, on which their nest was situated. Mr. Ussher, with James Bourke, who lived at the foot of the mountain, ascended within sight of the Eagle's cliff, but on inquiry found that the last Eagle was destroyed in the spring of 1910, the manager of the property saying that, as the Eagles killed lambs, they should be destroyed, and the result of his orders being that they are now exterminated, all being poisoned. So now there is only one remaining breeding haunt of Eagles in Ireland, and although that is strictly preserved by the owner of the estate, yet I fear their destruction in a few years will follow.—R. W.

Variety of the Gannet.—Referring to the supposed brown variety of a Gannet, which was seen by at least four persons at the Bass Rock in July, 1910, of which a figure kindly communicated by Mr. R. Fortune appeared in 'The Zoologist' (*ante*, p. 73), I now learn that no more has been seen of this anomalous bird. A close watch has been kept for it at the Bass Rock all this summer by Mr. J. M. Campbell, principal of the lighthouse, who is himself an ornithologist, but to no purpose. That the bird was an artificially coloured one there can be little, if any, doubt, as was long ago surmised by Mr. William Evans, of Edinburgh, and others. The nest on which it was photographed was this year occupied by two normally coloured Gannets, one of which may have been the individual in question returned to its proper ledge. Among the many curious varieties of birds which

have been placed on record in 'The Zoologist' and other journals, there does not appear to be an instance of a bird, by nature permanently white, turning brown. Ptarmigan have their well-known seasonal change, it is true, but that is not a case in point. No species of which the adult plumage is white, or nearly so—such as a Gannet, a Swan, a Stork, a Snowy Owl, or a Gull—has ever been known to assume a brown colour. I think I am right in supposing that such a *lusus naturæ* as this is unknown to ornithologists in any country. Brown and black birds become white not very infrequently, of which the Thrush and Blackbird are common examples, but that is in accordance with the ordinary law of albinism, to which every species is liable, and is easily explained by an absence of pigment in the feathers. Melanism, on the other hand, is produced by a superabundance of it, and is always much rarer than albinism.—J. H. GURNEY (Keswick Hall, Norwich).

Great Black-backed Gull breeding on an Inland Lake.—A young friend of mine, Mr. H. Scroope, Jun., of Ballina, when visiting that fine sheet of water in North Mayo—Lough Corr—discovered a pair of these Gulls having a nest on a grassy island frequented by hundreds of Black-headed Gulls. The destruction of eggs by these great Gulls was enormous, for on a corner of the island where the Gulls carried the eggs to eat, he says he saw as many egg-shells of the Black-headed Gulls as would have filled a basket. However, in order to prove the identity of the Gulls, he brought away their three eggs, the size of which beyond all doubt proved their species. He was careful in this, because a pair of Lesser Black-backed Gulls frequented the lake for some years, and their young, fledged, were seen accompanying their parents. This is the first instance that I have known of this large Gull breeding on an inland fresh-water lake in Ireland, which is situated at least nine or ten miles from the sea, and is twelve or fourteen miles from Downpatrick Head, the nearest breeding haunt of the Great Black-backed Gull on this coast.—ROBERT WARREN (Ardnaree, Monkstown, Co. Cork).

Most important provisions affecting animals are contained in the Protection of Animals Act (introduced by Mr. G. Greenwood, M.P.), which is about to receive the Royal Assent. The maximum punishment for cruelty has been increased from three to six months, and a fine of £25, while the period in which proceedings can be taken has been increased to two months. Power is given to a private

person to give another person into custody, on condition that the person so doing carries out the prosecution. In addition to providing for the destruction of animals which have been cruelly treated, a very important principle has been established by a clause inserted during the passage of the Bill through the House of Lords by Lord Leigh, on behalf of the National Canine Defence League, embodying the provisions of the Bill promoted some time ago by that Society, the object of which was to prevent dogs or other animals being subjected to revengeful treatment after conviction of the owner, and also to provide a deterrent to cruel treatment of performing or other valuable animals, the loss of which would mean a greater penalty than would the imposition of a simple fine. Under this clause an order can be made depriving the owner of the possession of the animal which was the subject of the charge, if there is reason to believe that it would be the victim of further cruelty if left with its owner. In the case of an order being made for the forfeiture of dogs, the Canine Defence League is offering to find good homes for the animals, and to bear all expenses connected therewith.

The new Act also provides for the inspection of spring traps every twelve hours, and imposes penalties on those who sell poisoned grain or seed, or place poison without taking reasonable precautions against access thereto by dogs, cats, fowls, or other domestic animals.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF
SCIENCE, PORTSMOUTH, 1911.

ADDRESS TO THE ZOOLOGICAL SECTION.

By Professor D'ARCY WENTWORTH THOMPSON, C.B., *President of the Section.*

MAGNALIA NATURÆ; OR, THE GREATER PROBLEMS OF BIOLOGY.

THE science of Zoology, all the more the incorporate science of Biology, is no simple affair, and from its earliest beginnings it has been a great and complex and many-sided thing. We can scarce get a broader view of it than from Aristotle, for no man has ever looked upon our science with a more far-seeing and comprehending eye. Aristotle was all things that we mean by "naturalist" or "biologist." He was a student of the ways and doings of beast and bird and creeping thing; he was morphologist and embryologist; he had the keenest insight into physiological problems, though lacking that knowledge of the physical sciences without which physiology can go but a little way: he was the first and is the greatest of psychologists; and in the light of his genius biology merged in a great philosophy.

I do not for a moment suppose that the vast multitude of facts which Aristotle records were all, or even mostly, the fruit of his own immediate and independent observation. Before him were the Hippocratic and other schools of physicians and anatomists. Before him there were nameless and forgotten Fabres, Rœsels, Réaumurs, and Hubers, who observed the habits, the diet, and the habitations of the sand-wasp or the mason-bee: who traced out the little lives, and discerned the vocal organs, of grasshopper and cicada; and who, together with generations of bee-keeping peasants, gathered up the lore and wisdom of the bee. There were fishermen skilled in all the cunning of their craft, who discussed the wanderings of tunny and mackerel, sword-fish or anchovy; who argued over the ages, the breeding-places and the food of this fish or that; who knew how the smooth dogfish breeds two thousand years before Johannes Müller; who saw how the male pipe-fish carries its young before Cavolini; and who had found the nest of the nest-building rock-fishes before Gerbe re-discovered it almost in our own day. There were curious students of the cuttle-fish (I sometimes imagine they may have been priests of that sea-born goddess to whom the creatures were sacred) who had diagnosed the species, recorded the habits and dissected the anatomy of the group, even to the discovery of that strange hectocotylus arm that baffled Della Chiaje, Cuvier, and Koelliker, and that Verany and Heinrich Müller re-explained.

All this varied learning Aristotle gathered up and wove into his great web. But every here and there, in words that are unmistakably

the master's own, we hear him speak of what are still the great problems and even the hidden mysteries of our science; of such things as the nature of variation, of the struggle for existence, of specific and generic differentiation of form, of the origin of the tissues, the problems of heredity, the mystery of sex, of the phenomena of reproduction and growth, the characteristics of habit, instinct, and intelligence, and of the very meaning of Life itself. Amid all the maze of concrete facts that century after century keeps adding to our store, these, and such as these, remain the great mysteries of natural science—the *Magnalia naturæ*, to borrow a great word from Bacon, who in his turn had borrowed it from St. Paul.

Not that these are the only great problems for the biologist, nor that there is even but a single class of great problems in Biology. For Bacon himself speaks of the *magnalia naturæ, quoad usus humanos*, the study of which has for its objects "the prolongation of life or the retardation of age, the curing of diseases counted incurable, the mitigation of pain, the making of new species and transplanting of one species into another," and so on through many more. Assuredly I have no need to remind you that a great feature of this generation of ours has been the way in which Biology has been justified of her children, in the work of those who have studied the *magnalia naturæ, quoad usus humanos*.

But so far are biologists from being nowadays engrossed in practical questions, in applied and technical Zoology, to the neglect of its more recondite problems, that there never was a time when men thought more deeply or laboured with greater zeal over the fundamental phenomena of living things; never a time when they reflected in a broader spirit over such questions as purposive adaptation, the harmonious working of the fabric of the body in relation to environment, and the interplay of all the creatures that people the earth; over the problems of heredity and variation; over the mysteries of sex, and the phenomena of generation and reproduction, by which phenomena, as the wise woman told, or reminded, Socrates, and as Harvey said again (and for that matter, as Coleridge said, and Weismann, but not quite so well)—by which, as the wise old woman said, we gain our glimpse of insight into eternity and immortality. These, then, together with the problem of the Origin of Species, are indeed *magnalia naturæ*; and I take it that inquiry into these, deep and wide research specially directed to the solution of these, is characteristic of the spirit of our time, and is the pass-word of the younger generation of biologists.

No small number of theories or hypotheses, that seemed for a time to have been established on ground as firm as that on which we tread, have been reopened in our day. The adequacy of natural selection to explain the whole of organic evolution has been assailed on many sides; the old fundamental subject of embryological debate between the evolutionists or preformationists (of the school of Malpighi, Haller, and Bonnet) and the advocates of epigenesis (the followers of

Aristotle, of Harvey, of Caspar F. Wolff, and of Von Baer) is now discussed again, in altered language, but as a pressing question of the hour; the very foundations of the cell-theory have been scrutinized to decide (for instance) whether the segmented ovum, or even the complete organism, be a colony of quasi-independent cells, or a living unit in which cell differentiation is little more than a superficial phenomenon; the whole meaning, bearing, and philosophy of evolution has been discussed by Bergson, on a plane to which neither Darwin nor Spencer ever attained; and the hypothesis of a Vital Principle, or vital element, that had lain in the background for near a hundred years, has come into men's mouths as a very real and urgent question, the greatest question for the biologist of all.

With all the growth of knowledge, with all the help of all the sciences impinging on our own, it is yet manifest, I think, that the biologists of to-day are in no self-satisfied and exultant mood. The reasons and the reasoning that contented a past generation call for re-inquiry, and out of the old solutions new questions emerge; and the ultimate problems are as inscrutable as of old. That which, above all things, we would explain baffles explanation; and that the living organism is a living organism tends to reassert itself as the biologist's fundamental conception and fact. Nor will even this concept serve us and suffice us when we approach the problems of consciousness and intelligence and the mystery of the reasoning soul; for these things are not for the biologist at all, but constitute the psychologist's scientific domain.

In Wonderment, says Aristotle, does philosophy begin,* and more than once he rings the charges on the theme. Now, as in the beginning, wonderment and admiration are the portion of the biologist, as of all those who contemplate the heavens and the earth, the sea, and all that in them is.

And if Wonderment springs, as again Aristotle tells us, from ignorance of the causes of things, it does not cease when we have traced and discovered the proximate causes, the physical causes, the Efficient Causes of our phenomena. For beyond and remote from physical causation lies the End, the Final Cause of the philosopher, the reason Why, in the which are hidden the problems of organic harmony and autonomy and the mysteries of apparent purpose, adaptation, fitness, and design. Here, in the region of teleology, the plain rationalism that guided us through the physical facts and causes begins to disappoint us, and Intuition, which is of close kin to Faith, begins to make herself heard.

And so it is that, as in Wonderment does all philosophy begin, so in Amazement does Plato tell us that all our philosophy comes to an end.† Ever and anon, in presence of the *magnalia naturæ*, we feel incline to say with the poet:

οὐ γάρ τι νῦν γε κἀχθίς, ἀλλ' αἰεί ποτε
ζῇ ταῦτα, κούδιες οἶδεν ἰξ' ὅτου 'φάνη.

* Met. i. 2, 982b, 12, &c.

† Cf. Coleridge, Biogr. Lit.

"These things are not of to-day nor yesterday, but evermore, and no man knoweth whence they came."

I will not quote the noblest words of all that come into my mind; but only the lesser language of another of the greatest of the Greeks:—"The ways of His thoughts are as paths in a wood thick with leaves, and one seeth through them but a little way."

A CASE OF A REMARKABLE EGG OF *FALCO TINNUNCULUS* LAID UNDER REMARKABLE CIRCUMSTANCES.

By C. J. PATTEN, M.A., M.D., Sc.D.

On Sunday, June 11 last, my tame Kestrel, which I have had for eight years, appeared to be in remarkably lively mood. When let out of her wire enclosure she indulged in her usual trick of pouncing on my shoe and biting at the leather repeatedly. When I shook her off she followed me across the yard, and on presenting my gloved hand she dashed at it, at the same time dropping her wings like a curtain, as though she were shielding her favourite mouse. Many other tricks which I have frequently found her indulging in were particularly well performed that morning. I was therefore exceedingly pleased that after my absence from home for the greater part of the preceding week I returned to find her so well and lively. However, in the afternoon a remarkable change came over her. She retired to a corner, and, assuming an almost horizontal position, so that her head, back, and tail were almost parallel with the ground, she became so apathetic that I suspected poisoning from some of the food (a young rat caught in a trap) she had lately partaken of. Unable to rouse her, I carried her into my study, where she again crept into a corner and behaved similarly. She remained in this condition until 6.30 p.m., at which time I left her alone. On my return at 10.30 p.m. she still appeared to be in the same condition. I tried to rouse her by pretending to attack her with my hand and by splashing her with cold water, but it was of no avail. I then left her in the corner while I wrote letters. She now began to utter a few faint squeaks at intervals. At 11.45 p.m. she gave a rather painful cry, and on going over to see what was the matter I found she had laid an egg. Almost immediately she began to get lively, and so I had to exercise care lest she might break the egg. Fortunately I succeeded in getting possession of the latter safely. Remarkable as this case of ovulation may be, the egg itself is none the less remarkable. Although the usual brownish-red egg (so profusely pigmented that no trace of white is visible) may sometimes be represented by one richly mottled on a yellowish-white or pinkish ground-colour, I may say I have never before seen a Kestrel's egg such as the one my bird laid. This egg

is milky-white in colour, almost unspotted except at its larger end. This part is spotted and blotched with rich purplish-brown intermixed with light greyish-purple, the whole pigmentation forming a broken zonular band. The egg might be compared to an enlarged model of a Greenfinch's egg in which the ground-colour has lost its faint greenish hue. The texture of the shell is fine and thin, but sufficiently strong to allow of the contents being extruded by means of the blow-pipe. The egg is less rounded at the smaller end than usual, and resembles in shape an ordinary domestic fowl's egg. In size it is perfectly normal, *viz.*, length, 3.9 cm.; breadth, 3 cm.; the average measurements given for the Kestrel's egg by Saunders being, length, 4 cm.; breadth, 3.1 cm. That is to say, my Kestrel's egg is 1 mm. less than the normal in length and in breadth. It seems impossible to offer an explanation for this strange case of ovulation. But I may perhaps be allowed to refer to one point in connection with the bird's diet just before it laid the egg. During my absence from home, which lasted four days, the bird was supplied with sufficient food for that time, but it was all given on the first day. When I returned the greater part was untouched, the reason being that the warm weather had affected the food sufficiently to render it adverse to the bird's palate. Hence the hawk fasted for three days. On my return I gave her a plentiful supply of fresh ox-spleen and liver, which she gorged herself with, and this highly nutritious hearty meal, coming after a fast and in a warm change of weather, may have toned her to such a physiological state that her ovaries became sufficiently active to induce ovulation. Such an explanation is vague and theoretical, and I give it only for what it is worth.

NOTICES OF NEW BOOKS.

The Grouse in Health and in Disease ; being the Final Report of the Committee of Inquiry on Grouse Disease. Two vols. Smith, Elder & Co.

THESE two quarto volumes constitute the most exhaustive monograph on the Grouse that has yet appeared, and one that is a model for future investigators to follow ; the contributors are accepted authorities, and the illustrations are a no inconsiderable feature in a well-designed publication.

The work commences with "The Systematic Position of the Grouse," by A. H. Evans, followed by a very full life-history of the bird, by A. S. Leslie, which will be read with interest by both the sportsman and the ornithologist. "The Changes of Plumage in the Red Grouse in Health and in Disease," by Edward A. Wilson, deals with some controverted points on the subject, and is fully and excellently illustrated ; it is a subject requiring ample treatment, and has received it. The food of the bird is described by Messrs. Wilson, Leslie, and Grimshaw, and its causes of mortality are shown to be numerous, but its powers of survival very considerable. Birds which had lost a wing, "cut off clean at the shoulder," have not only survived, but succeeded in subsequently rearing a healthy brood. Barbed wire is undoubtedly a danger ; in South Africa we have even seen a locust in flight impale itself. But Grouse disease in its "epidemic" or "epizootic" form is the real subject of investigation, and one that principally concerned the inquiry of the Committee. It has been dealt with as exhaustively as possible. The names of Drs. Shipley, Fantham, Leiper, Seligmann, Cobbett, Sambon, Hammond Smith, and others are sufficient to prove the value of this, the chief work of the research. As Lord Lovat subsequently remarks :—"After examining nearly two thousand cases of death from other than natural causes, and the facts and surrounding circumstances of over two hundred separate outbreaks of disease, the Committee have arrived at the conclusion

that the Strongyle worm, and the Strongyle worm alone, is the immediate *causa causans* of adult 'Grouse Disease.'**

The Freshwater Fishes of the British Isles. By C. TATE REGAN,
M.A. Methuen & Co., Ltd.

THE angler frequently knows more about the bionomics of his familiar fishes than does the technical ichthyologist; on the other hand, he is not versed in the discrimination of species, as may be seen in many records, where Roach are confused with Rudd and small Chub with Dace. This book is well entitled to its foreword: "One for the angler, and for all who wish for reliable information as to our fresh-water fishes, their specific characters, geographical distribution, and life-history."

The Char, on which the author is an authority and can write with first-hand confidence, receives ample treatment, and provides one of the most valuable contributions to the volume—in fact, we must go to this book for a practical digest of the differences and distribution of these fishes. Mr. Regan, against the old myth of the friendship of the Pike and Tench, writes: "In some localities a small Tench is said to be a very good bait for a Pike." This is a common opinion among anglers on the Mole, where the writer of this notice has even known a small Perch to serve the same useful purpose. As regards the weight of big Pike, an illustration is given of the "great Pike of Whittlesea Mere," which may be regarded as the record English specimen of that fish, and was stated to weigh 52 lb.; it was taken when the Mere was drained in 1851. Of the Bream, Mr. Regan rightly distinguishes but two species, though among some anglers there is an erroneous disposition to consider there are three. We also read that "on warm summer days a number of these fish may sometimes be seen lying motionless near the surface of the water." This description is not an absolute one, for on some parts of the Mole—a Bream home—these fish can generally be seen on warm summer days in considerable numbers

* Prof. J. Arthur Thomson, in the Murtle Lecture, delivered in Aberdeen University, 1909, remarked that "wild animals in nature have parasites, but no diseases." Can we absolutely accept this opinion after a perusal of the above report on Grouse disease?

close to the surface, and not motionless, but patrolling the surface of the stretch they frequent.

The illustrations are excellent, and drawn by Mr. Regan himself, with the result that the real specific differences and general facies receive a prominence not always found when the eye of the artist and not that of the ichthyologist is a more dominant agent.

Guide to the Exhibition of Animals, Plants, and Minerals mentioned in the Bible. Printed by Order of the Trustees of the British Museum.

"It was thought by the Trustees of the British Museum that an Exhibition of Animals, Plants, and Minerals mentioned in the Bible would form an interesting supplement to the literary and historical Biblical Exhibition which has been arranged at Bloomsbury for the Tercentenary of the Authorized Version, and instructions were given for its preparation." The result is the Collection now placed in one of the bays of the Central Hall of the Natural History Museum, and also the publication of this Guide-book, which is, however, by its value in literary research, considerably more than its title implies. The Animals and Minerals respectively have been selected, arranged, and labelled by Mr. R. Lydekker and Dr. G. F. Herbert Smith, and the Plants by Dr. A. B. Rendle.

The principal English works on the subject hitherto have been Dr. Tristram's 'Natural History of the Bible,' and a more popular publication by the late J. G. Wood, entitled 'Bible Animals,' but there was every room and demand for the concise statements to be found in this small but excellent 'Guide.' Of course, as regards the animals, the non-mythical are alone referred to, the mythical being entirely in the domain and knowledge of the students of comparative theologies.

But the strength of this publication will be found in Dr. Fletcher's essay, "showing how modern interpretations of the ancient names of Biblical minerals have been deduced." This, though somewhat out of the purview of 'The Zoologist,' will not only interest naturalists, but make this 'Guide' indispensable to Biblical students, and provide one of those out-of-

the-way treasures prized by literary men. It is well to be reminded that St. John, the seer of Patmos, was a contemporary of Pliny, the naturalist, and Dr. Fletcher remarks: "Pliny's great work on Natural History, published in 77 A.D., only two years before his death, tells us what was known about minerals by naturalists at the time when St. John himself was living." While of Theophrastus, whose Greek work on Stones, which, "though brief is very useful," we read: "The author lived about 370-287 B.C., and therefore, though his book was probably completed before the Septuagint translation was begun (270 or 280 B.C.); he must have been a contemporary of the translators themselves." These are truly links of the past, and they help us to rightly understand it. May other naturalists who are also scholars follow Dr. Fletcher's lead.

EDITORIAL GLEANINGS.

WHITTLESEA MERE SINKS OVER TEN FEET IN SIXTY YEARS.—The drought has had an extraordinary effect on the bed of the once famous Whittlesea Mere, the greatest of the Cambridgeshire Fens. Ever since the mere was drained in 1851 the land has gradually shrunk. During the previous few years no perceptible difference has taken place, but this year there has been a further shrinkage, and probably the bed of the mere is now as low as it can possibly get. After the mere was drained in 1851 an iron post was driven firmly through the peat into the underlying bed of gault. The gault was unshrinkable and as firm as a rock. The post was driven in until the top was level with the spongy land, and then a large square iron plate bearing the date was fixed. Deprived of the water of the mere the peaty fenland has shrunk to a marked degree this year, and now the iron pillar stands over ten feet out of the ground. The pillar has not risen; it is immovable.—*Daily Chronicle*, Sept. 13th.

This is an interesting record in connection with a reference to the Mere on a previous page (*cf.* notice of Mr. Regan's book, *ante*, p. 357).

ONE of the greatest attractions of the Zoo at present to those who like to see foreign birds exercising their natural activities consists of a pair of the common pink-and-grey Cockatoos, well known to Australians as "Galahs," which are enjoying their freedom in the Gardens. They divide their time between the society of the Marmots and Squirrels in the Squirrels' enclosure, and that of their caged fellows in the Parrot Aviary at the opposite side of the Gardens. Just about tea-time they are most in evidence; after taking a meal *à la carte* with the rodents, they enjoy themselves by nibbling the bark of an old dead willow in the neighbouring waterfowls' enclosure or the turf on the Fellows' Lawn. These amusements are varied by alarums and excursions on the wing. Yelling at the top of their voices, the two Cockatoos start on a fly round, showing incidentally a power of flight which no one would suspect from seeing them in the Parrot Aviary. There they seem nearly as heavy on the wing as Ducks; but the free birds show a wonderful command of wing, flapping, when once well up in the air, with the slow, easy stroke of a Sea-Gull, shifting like Swallows, and swooping like Hawks. No bird that I have ever seen flying at large shows such a pure joy in flight for its own sake, or has such a splendid appearance in showing it. As the Cockatoo turns, its lovely rose-pink breast is presented to the eye, and stands out like a great flower when it alights on a tree. The installation of these free Cockatoos at the Gardens was quite accidental. The cock bird turned up one day as a "stray" in the Squirrels' enclosure, and speedily made it clear that he had come to stay. Of his associates, he plainly dispised the wild Wood Pigeons, and ignored the Squirrels; the Marmots he seemed to regard as kindred spirits, and used to play with them, stroking their faces or clutching their tails playfully with his foot. At other times he would tumble about with a dry crust of bread as if juggling, and altogether lived the life of a jovial bachelor until a mate was put out for him in a cage. When it was seen that the solitary Adam appreciated this companion, his Eve was liberated, and the two have lived happy ever since.—FRANK FINN (*Pall Mall Gazette*, Sept. 13th).

